CLAIMS

What is claimed is:

1. A pumping system, comprising:

a submersible, centrifugal pump having a first housing section, a second housing section, a unitary intermediate body to which the first housing section and the second housing section are threadably engaged, a shaft extending through the first housing section and the second housing section, a plurality of impellers and a plurality of diffusers located within the first housing section and within the second housing section, wherein the unitary intermediate body absorbs compressive loading applied to a portion of the plurality of diffusers.

2. The pumping system as recited in claim 1, wherein the shaft is a single common shaft extending through the first housing section and the second housing section.

3. The pumping system as recited in claim 1, wherein the intermediate body comprises a central abutment from which a pair of threaded regions extend in opposite directions.

4. The pumping system as recited in claim 1, wherein the intermediate body comprises a plurality of flow passages.

5. The pumping system as recited in claim 1, wherein the intermediate body comprises at least one seal on each side of the central abutment.

6. The pumping system as recited in claim 1, further comprising a submersible motor to drive the submersible, centrifugal pump, and a motor protector coupled to the submersible motor.

7. A method of assembling a pump having a plurality of stages, comprising:

assembling a first plurality of stages in a first housing;

attaching an intermediate body to the first housing;

compressing the first plurality of stages within the first housing;

connecting a second housing to the intermediate body; and

compressing a second plurality of stages within the second housing.

8. The method as recited in claim 7, wherein compressing the second plurality of stages comprises compressing the second plurality of stages with a head member.

9. The method as recited in claim 7, wherein compressing the first plurality of stages comprises compressing the first plurality of stages with a compression member.

10. The method as recited in claim 7, wherein attaching comprises threading the intermediate body onto the first housing.

11. The method as recited in claim 10, wherein connecting comprises threading the second housing onto the intermediate body.

12. The method as recited in claim 7, wherein attaching comprises threading the intermediate body to a position at which a first plurality of diffusers is compressed.

13. The method as recited in claim 7, wherein compressing comprises compressing a second plurality of diffusers.

14. The method as recited in claim 7, further comprising installing a single, unitary shaft through the first plurality of stages and the second plurality of stages.

15. A method of extending the potential length of a centrifugal pump, comprising:

assembling a single pump with multiple stages;

locating at least one intermediate body between groups of the multiple stages;

supporting the at least one intermediate body with an external housing; and

separately loading at least one group of the multiple stages on each side of the at least one intermediate body.

16. The method as recited in claim 15, wherein supporting comprises threading housing sections to the at least one intermediate body.

17. The method as recited in claim 15, wherein separately loading comprises loading a plurality of diffusers in each group of the multiple stages.

18. The method as recited in claim 15, wherein loading comprises first axially loading one group of stages within a first housing section via the intermediate body; then compressing another group of stages against an opposite side of the intermediate body and within a second housing section.

19. The method as recited in claim 15, wherein loading comprises applying a force against at least one group of the multiple stages with a compression member.

20. The method as recited in claim 19, wherein applying comprises applying the force with a compression tube.

21. The method as recited in claim 19, wherein applying comprises applying the force with a threaded compression ring.

22. A system for assembling a pump, comprising:

means for assembling a single pump that may be coupled into a submersible pumping system; and

means for compressing groups of stages separately within the single pump.

23. The system as recited in claim 22, wherein the means for assembling comprises an outer housing.

24. The system as recited in claim 22, wherein the means for compressing comprises an intermediate body.

25. A method of increasing the potential length of a multistage pump in which each stage has an impeller and a diffuser, comprising:

a. alternately stacking a diffuser and an impeller over the shaft;

b. locking the impeller to the shaft;

c. pulling the shaft to draw the impeller towards the diffuser; and

d. repeating steps a., b. and c.

26. The method as recited in claim 25, wherein repeating comprises repeating steps a., b. and c. for each stage of the pump.

27. The method as recited in claim 26, further comprising compressing the diffusers.

28. The method as recited in claim 25, further comprising varying a distance the shaft is pulled for different stages.

29. The method as recited in claim 25, wherein pulling comprises lifting the shaft.

30. The method as recited in claim 25, wherein alternately stacking comprises alternately stacking a single diffuser and a single impeller over the shaft.